इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 1922 (1961): Liquid gold, bright [CHD 10: Glassware]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

Indian Standard
SPECIFICATION FOR LIQUID GOLD, BRIGHT

First Reprint JANUARY 1977
(Incorporating Amendment No. 1)

UDC 686.492.1

© *Copyright* 1977

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr. 2 ***January* 1962**

Indian Standard

SPECIFICATION FOR LIQUID GOLD, BRIGHT

Glassware Sectional Committee, CDC 10

Chairman	*Representing*
DR ATMA RAM	Council of Scientific & Industrial Research
Members	
SHRI K ALMOND	Hindustan Pilkingtou Glass Works Ltd Calcutta
SHRI U D BUDHALAKOTI (*Alternate)*	
DR A H AMIN	Indian Chemical Manufacturers' Association, Calcutta
SHRI M ROHATGI *(Alternate)*	
SMRI SUKHAMO BHATTACHARYA	Bengal Immunity Research Institute Calcutta
DR M L SEN GUPTA *(Alternate)*	
SHRI P S BHUSKUTF	Ogale Glass Works Ltd, Opalewadi
SHRI B S OGALE *(Alternate)*	
SHRI HARI DUTTA	Small Scale Industries (Ministry of Commerce & Industry)
DR A K HAZRA	Haffkine Institute, Bombay
SHRI Y S NIMBKAR *(Alternate)*	
DR S R LELI	Industrial & Lngineering Apparatus Co Ltd, Bombay
SHRI J B MUKERJI	Ministry of Defence (R & D)
SHRI B M L SAXENA (*Alternate)*	
SHRI K H PAREKH	Office of the Director of Industries Government of Uttar Pradesh
SHRI D C ROY	National Instruments Ltd Calcutta
SHRI N C SEN	Indian lamp Factories Association Calcutta
SHRI N G SIRKAR	Scientific Indian Glass Co Ltd , Calcutta
SHRI I B SEN GUPTA *(Alternate)*	
TECHNICAL DIRECTOR (CHEMICALS)	Tariff Commission Bombay
SHRI K TOJIMA	Indo-Asahi Glass Co Ltd , Bhadaninagar
SHRI S CHAKRABORTFE *(Alternate)*	
DR S P VARMA	Development Wing (Ministry of Commerce and Industry)
SHRI S R KHANNA *(Alternate)*	
SHRI S C VARSHNEI	All-India Glass Manufacturers' Federation New Delhi, *and* U P Glass Works Ltd , Bahjoi
SHRI K C VARSHNEI *(Alternate)*	U P Glass Works Ltd , Bahjoi
DR SADGOPAL, Deputy Director (Chem)	Director ISI *(Ex-officio Member)*

Secretaries

SHRI S SUBRAHMANYAN
Assistant Director (Chem), ISI

SHRI D DAS GUPTA
Assistant Director (Chem), ISI

Liquid Gold Subcommittee, CDC 10 . 10

Convener	
DR S. N. PRASAD	Council of Scientific and Industrial Research
Members	
DR S KUMAR *(Alternate* to Dr. S N Prasad)	
SHRI RAGHUBIR SINGH SAINI	Glass Industrial Syndicate, Firozabad
SHRI DHARMENDRA DUTTA PALIWAL *(Alternate)*	
DR S P VARMA	Development Wing (Ministry of Commercc & Industry)
SHRI S R. KHANNA *(Alternate)*	

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard
SPECIFICATION FOR
LIQUID GOLD, BRIGHT

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 21 October 1961, after the draft finalized by the Glassware Sectional Committee had been approved by the Chemical Division Council.

0.2 Liquid gold is the name given to the material containing solution of organic compound of gold, which when applied on to glass- and ceramic-ware leaves behind a film resembling gold on the material on firing. Liquid gold of various grades is produced in the country to the extent of about 4 300 kg, according to the figures available for 1958-59, for use in the glass and ceramic industry. Two varieties of liquid gold, bright and burnish, are prevalent, the former producing a bright film and the latter a matt film. This standard covers the requirements of the bright liquid gold only. It is hoped that the formulation of an Indian Standard specification on liquid gold would help the consumers in procuring quality materials for their use.

0.3 Taking into consideration the views of manufacturers, users and technologists, the Sectional Committee responsible for the preparation of this standard felt that it should be related to the trade practices followed in the country in this field. This standard is based on the exteasive investigations carried out at the Central Glass & Ceramic Research Institute, Calcutta, on samples of indigenous as well as imported liquid gold.

0.4 Wherever a reference to any Indian Standard appears in this specification, it shall be taken as a reference to the latest version of the standard.

0.5 Metric system has been adopted in India and all quantities appearing in this standard have been given in this system.

0.6 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2-1960 Rules for Rounding Off Numerical Values *(Revised)*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

0.7 This standard is intended chiefly to cover the technical provisions relating to liquid gold, bright, and it does not include all the necessary provisions of a contract.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of test for the material commercially known as liquid gold, bright, for use on glass and glazed ceramic articles.

2. SAMPLING

2.1 A sample of convenient size shall be taken from each of the bottles containing the material after shaking it thoroughly.

3. REQUIREMENTS

3.1 Description — The material shall be homogeneous and free from any settled residue. When applied in the diluted form as recommended by the manufacturer on a glass or glazed ceramic article, it shall not show any brush mark on drying.

3.1.1 Brushing shall be done with a camel hair brush with a bristle length of about 5 mm and with its tuft of hair in a cylindrical shape ending in a cone. The brush shall be free from loose hair and perfectly clean.

3.2 Drying Time — The freshly diluted material when applied in accordance with **3.1.1** shall dry within one hour at room temperature.

3.3 Firing Temperature — The material when applied in accordance with **3.1.1** shall mature, that is, give a permanent bright film, when fired at the temperature range recommended by the manufacturer.

3.3.1 Usually the firing temperature is 550° to 620°C for glass articles and 650 to 750°C for glazed ceramic articles.

3.4 Appearance of the Film — The film of the material shall be bright and shall be of a colour closely matching the colour of the film on the sample agreed to by the purchaser and supplier when compared in diffused day light.

3.5 The film of the material after firing shall satisfy the requirements of the tests given in 4 for abrasion resistance and for resistance to weathering.

3.6 Gold Content

3.6.1 The amount of gold in the material shall not differ from the value declared by the manufacturer by more than 0.25 percent when determined as in Appendix A.

NOTE — Commonly the gold content of liquid gold is 12 percent by weight.

3.6.2 The ash of the material shall contain 94 to 96 percent by weight of gold when determined as in Appendix A.

4. TESTS

4.1 Abrasion Test — The gold film shall be rubbed vigorously with the right hand thumb, while the article under test is held by the left hand. The right hand thumb shall be moved 10 times counting to and fro. The gold film shall be taken to have satisfied this abrasion test if it does not get detached from the article.

4.2 Resistance to Weathering — A portion of the article having gold film shall be autoclaved at 1.0 kg/cm^2 pressure for 30 minutes. The appearance of the autoclaved film shall be similar to that of the portion which was not autoclaved.

5. PACKING AND MARKING

5.1 The material shall be packed in glass bottles of suitable capacity agreed to between the purchaser and supplier.

5.2 Each bottle shall be marked with the following information:

a) Name of the material;
b) Manufacturer's name, and trade-mark, if any;
c) Mass of contents in grams;
d) Gold content, percent by mass; and
c) Year of manufacture.

5.2.1 Each container may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

APPENDIX A

(*Clauses* 3.6.1 *and* 3.6.2)

DETERMINATION OF GOLD CONTENT IN LIQUID GOLD, BRIGHT, AND ITS ASH

A-1. REAGENTS

A-1.1 Quality of Reagents — Unless specified otherwise 'pure chemicals' and distilled water [*see* IS : 1070-1960 Specification for Water, Distilled Quality (*Revised*)] shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-1.2 Aqua Regia — a mixture of hydrochloric acid, analytical reagent grade (*see* *IS: 265-1950 Specification for Hydrochloric Acid), and nitric acid, analytical reagent grade (*see* *IS: 264-1950 Specification for Nitric Acid), in the ratio of 3 : 1 by weight.

A-1.3 Hydrochloric Add — of the following concentrations:

a) concentrated, analytical reagent grade (*see* *IS: 265-1950);
b) solution, 3 percent by volume; and
c) dilute solution, 1 percent by volume.

A-1.4 Sulphurous Add — saturated.

A-2. APPARATUS

A-2.1 Silica Dish — of 30-ml capacity, with lid.

A-2.2 Electric Muffle Furnace — capable of giving a temperature of about 800°C.

A-3. PROCEDURE

A-3.1 Estimation of the Ash Content — Take about 5 ml of the material by means of a pipette in the weighed silica dish, cover it with lid and weigh accurately as quickly as possible. Remove the cover and heat the dish slowly and carefully by a moving flame. Due to the presence of essential oils, etc, the substance has a tendency to froth and spurt while heating. When the volatile liquid is completely removed and the tendency of frothing stops, heat the dish at about 800°C in the electric muffle to burn off the carbonaceous matter. Heat the dish with the ash to constant weight. Calculate the total percentage of the ash on the weight of the material taken.

A-3.2 Estimation of Gold

A-3.2.1 Dissolve the ash in 10 ml of *aqua regia.* Evaporate the solution to dryness on a sand-bath. Dissolve the residue in 25 ml of 3 percent hydrochloric acid solution, warm and filter. A black residue will be obtained, while gold will remain in solution. Wash the insoluble matter four to five times with hot dilute hydrochloric acid solution (1 percent) and finally with distilled water (*see* IS: 1070-1960) till it is free from chloride. Collect the washings with the filtrate and discard the black residue.

A-3.2.2 To expel nitric add completely from the filtrate obtained in **A-3.2.1,** add to it about 10 ml of concentrated hydrochloric add and evaporate to dryness; repeat addition of 10 ml of acid and subsequent evaporation at least four times.

A-3.2.3 Take up the residue with dilute hydrochloric add solution (one percent) and adjust the acidity to 5 ml of concentrated hydrochloric add per 100 ml of solution. Add 25 ml of a saturated solution of sulphurous acid for each 100 ml of the solution. Allow the solution to stand on a steam-bath for one hour and add 5 to 10 ml more of sulphurous acid. The solution is allowed to cool and it should still smell of sulphurous acid. Filter the contents through an ashless close-grained filter paper containing paper pulp and wash three to four times by decantation with hot dilute hydrochloric acid solution (1 percent). Finally transfer the precipitate to the filter paper, wash again five to six times with the dilute acid solution and finally with distilled water (*see* IS: 1070-1960). Ignite the filter paper with the metallic gold in a weighed silica dish to a constant weight.

---

*Since revised.

A-3.3 Calculate the percentage of gold on the weight of the ash and on the weight of the material taken.

PUBLICATIONS OF INDIAN STANDARDS INSTITUTION

INDIAN STANDARDS

Over 8 000 Indian Standards covering various subjects have been issued so far. Of these, the standards belonging to the Chemical Group fall under the following categories:

- Acids
- Adhesives
- Alcohols and allied products
- Alkalis
- Brushware
- Cerarmicware, enamelware and laboratory porcelain
- Chemical hazards and safety
- Chemicals, inorganic (miscellaneous)
- Chemicals, organic (miscellaneous)
- Coal and coke
- Coal carbonization products
- Coated fabrics
- Cosmetics and toilet goods
- Dental materials
- Drying oils
- Dye intermediates
- Electroplating chemicals
- Explosive and pyrotechnic materials
- Fertilizers
- Fillers, stoppers and putties
- Footwear
- Glass and glassware
- Industrial gases
- Inks and allied products
- Laboratory glassware, thermometers and related apparatus
- Lac and lac products
- Leather, leather goods *and* leather dressings
- Linters and allied products
- Lubricants and related products
- Oil pastes
- Oils & fats, oleaginous seeds and fruits
- Painters' materials (miscellaneous)
- Paper and its products
- Paper and pulp board packaging materials
- Perfumery materials, natural and synthetic
- Petroleum and petroleum products
- Photographic chemicals
- Pigments and extenders
- Plastics
- Polishes
- Printing inks
- Ready mixed paints and enamels
- Rubber and rubber products
- Soaps and other surface active agents
- Tanning materials and allied products
- Thermal insulation materials
- Thinners and solvents
- Varnishes and lacquers
- Water and water treatment
- Water based paints
- Unclassified

OTHER PUBLICATIONS

ISI Bulletin (Published Every Month)	
Single Copy	Rs 4.00
Annual Subscription	Rs 36.00
Standards: Monthly Additions	
Single Copy	Re 0.30
Annual Subscription	Rs 3.00
Annual Reports (from 1948-49 Onwards)	Re 2.00 to 6.00
ISI Handbook, 1975	Rs 30.00

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephone : 27 01 31 (20 lines)

Telegrams : Manaksanstha

Regional Offices:		Telephone
Western : Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
Eastern : 5 Chowringhee Approach	CALCUTTA 700072	23-08 02
Southern : C.I.T. Campus, Adyar	MADRAS 600020	41 24 42
Branch Offices:		
'Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMADABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	2 76 49
Kothi No. 90, Sector 18A	CHANDIGARH 160018	2 83 20
5-3-56/57 Nampally Station Road	HYDERABAD 500001	4 57 11
117/418 B Sarvodaya Nagar	KANPUR 208005	82 72
B.C.I. Bldg (Third Floor), Gandhi Maidan East	PATNA 800004	2 56 55

Reproduced by Reprography Unit, ISI, New Delhi